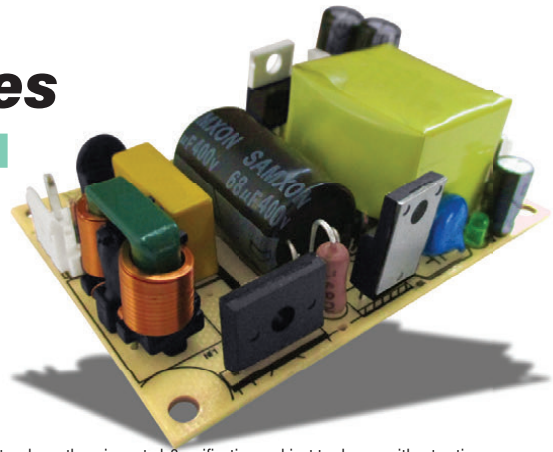


MPO-45SE Series

Single Output, 45W Compact, Open Frame AC/DC Power Supplies



Key Features:

- 45W Output Power
- Universal 85-264 AC Input
- EN 62368 Approval (UL)
- 3.0 x 2.0 In Package
- Seven Standard Models
- Meets EN 55032 B
- Meets IEC Safety Class II
- >300 kHour MTBF
- Low Cost



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Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range	Universal	85		264	VAC
		100		370	VDC
Input Frequency		47		63	Hz
Input Current	See Model Selection Guide				
Inrush Current	Cold Start, 115 VAC		35.0		A Pk
	Cold Start, 230 VAC		50.0		
Start-Up Time	85-264 VAC Input, Full Load		2,000		mSec
Safety Ground Leakage Current	240 VAC/ 50 Hz			0.25	RMS

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy	3.3V Output		±3.0		%
	All Other Outputs		±2.0		
Line Regulation	V _{IN} = 100 VAC to 240 VAC		±0.5		%
Load Regulation	I _{OUT} = 0% to 100%		±1.0		%
Ripple & Noise (20 MHz)	See Note 1		50	100	mV
Hold-Up Time	230 VAC		50		mSec
Temperature Coefficient			±0.02		%/°C
Over Current Protection	Self Recovery		150		%I _{OUT}
Standby Power Consumption				0.5	W
Short Circuit Protection, See Note 2	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage, See Note 3	Input to Output	3,000			VAC
Switching Frequency			65		kHz

EMI, See Page 3

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-25	+25	+70	°C
Storage Temperature Range		-25		+85	°C
Cooling	Free Air Convection (See Derating Curve)				
Altitude				2,000	m
Humidity	RH, Non-condensing			90	%

Physical

Size	See Mechanical Drawing (Page 3)				
Weight	3.16 Oz (90 g)				

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	300			kHours
Lead Temperature, See Note 4	Wave Solder			260	°C
	Hand Solder			360	
Safety Standards	UL/cUL 62368-1 recognition (UL certificate)				
Safety Class	Class II				

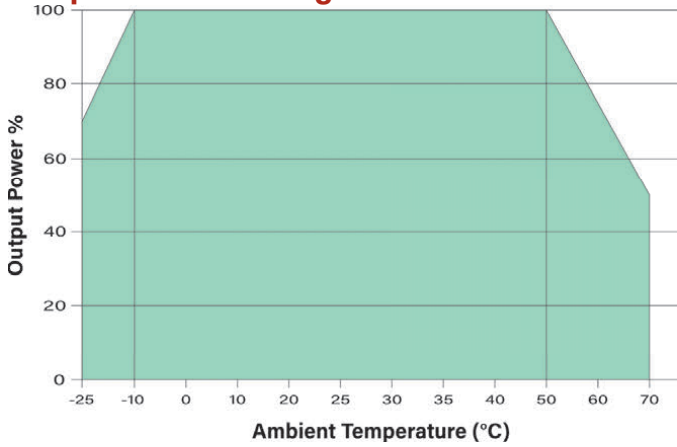
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Model Number	Input		Output			Over Voltage Protection (VDC)	Max Output Capacitance (μF)	Efficiency (% Typ)	Fuse Rating Slow-Blow
	Current (A)		Voltage (VDC)	Current (A)					
	115 VAC	230 VAC		Rated	% Min.				
MPO-45S-03E	1.20	0.70	3.3	8.000	0.00	7.50	30,000	76	3.15A/250V
MPO-45S-05E	1.20	0.70	5.0	8.000	0.00	9.00	20,000	82	3.15A/250V
MPO-45S-09E	1.20	0.70	9.0	4.444	0.00	16.0	6,000	84	3.15A/250V
MPO-45S-12E	1.20	0.70	12.0	3.750	0.00	20.0	4,000	84	3.15A/250V
MPO-45S-15E	1.20	0.70	15.0	3.000	0.00	24.0	3,500	86	3.15A/250V
MPO-45S-24E	1.20	0.70	24.0	1.875	0.00	35.0	1,000	86	3.15A/250V
MPO-45S-48E	1.20	0.70	48.0	0.940	0.00	60.0	600	87	3.15A/250V

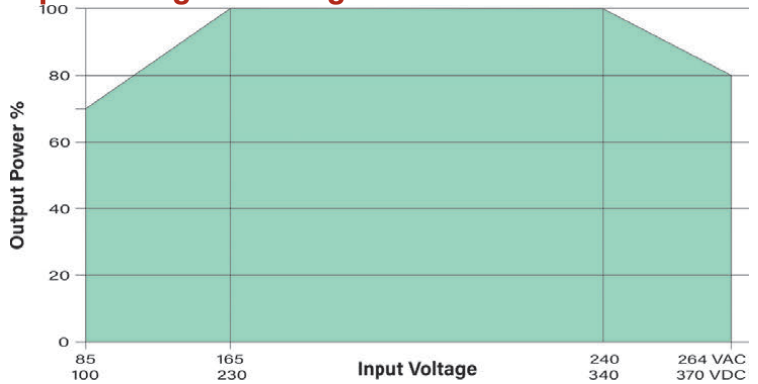
Notes:

- Output ripple is measured at 20 MHz bandwidth using 0.1 μF and 10 μF capacitors connected in parallel as close to the power supply terminals as possible.
- Output short circuit protection is provided by a "hiccup mode" circuit. The unit recovers automatically when the fault condition is removed.
- Input-output isolation is tested for 60 sec with a leakage current of <5 mA.
- Lead temperature is specified for 5 to 10 seconds for wave soldering with a tolerance of ±5°C. For manual soldering it is specified for 3 to 5 seconds with a tolerance of ±10°C.
- These units will operate at no load without damage. For most applications however, MPD recommends that a minimum load always be used. Contact the factory for more information.
- All units include an on-board slow blow fuse rated at 3.15A/250V. Since this fuse is not field replaceable, it is recommended that an external fuse be used on the input of the power supply for protection.

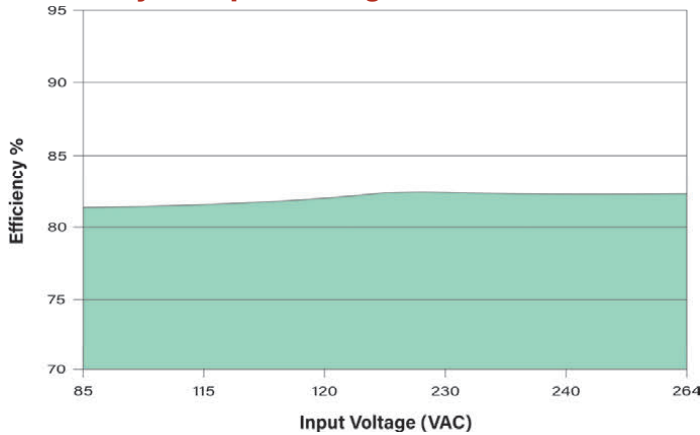
Temperature Derating



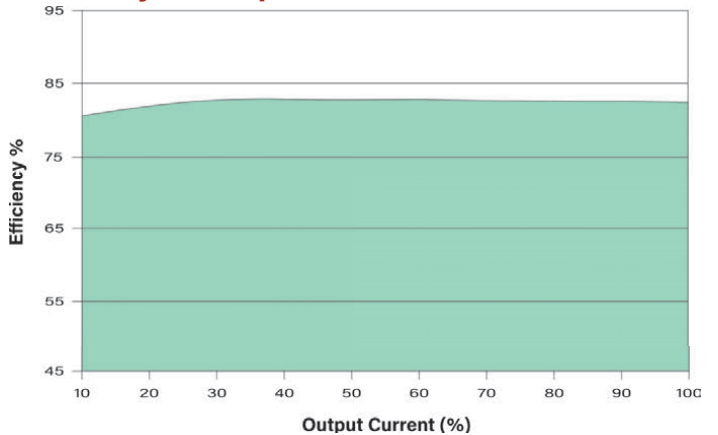
Input Voltage Derating



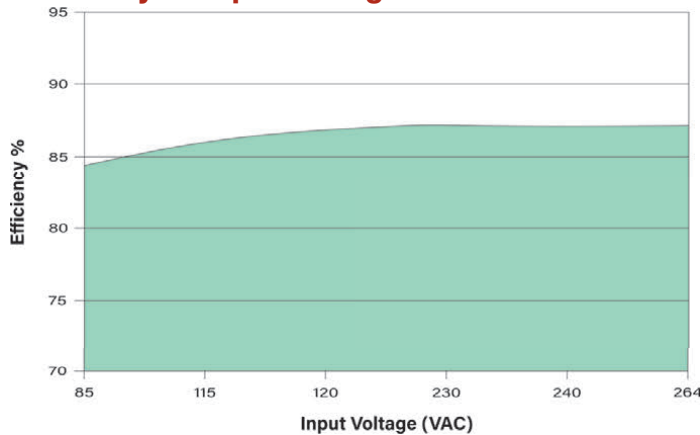
Efficiency vs Input Voltage: 5 V_{OUT}



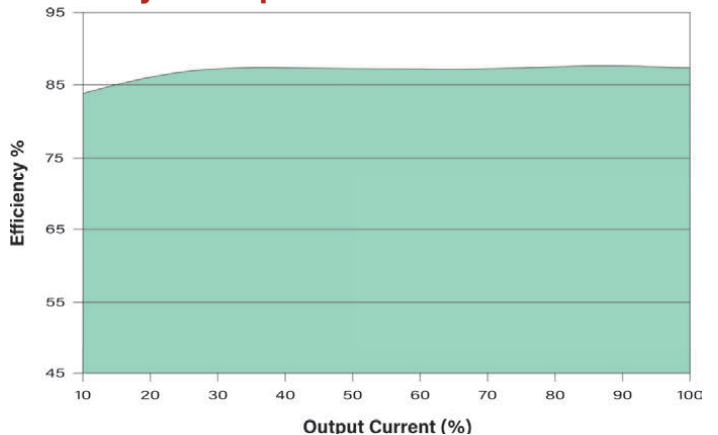
Efficiency vs Output Load: 5 V_{OUT}



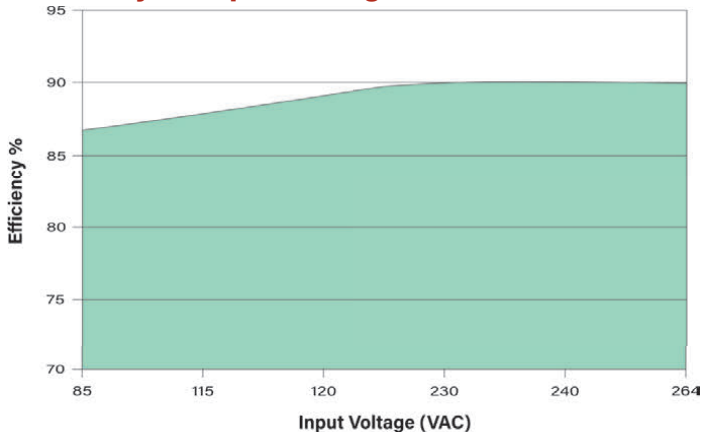
Efficiency vs Input Voltage: 12 V_{OUT}



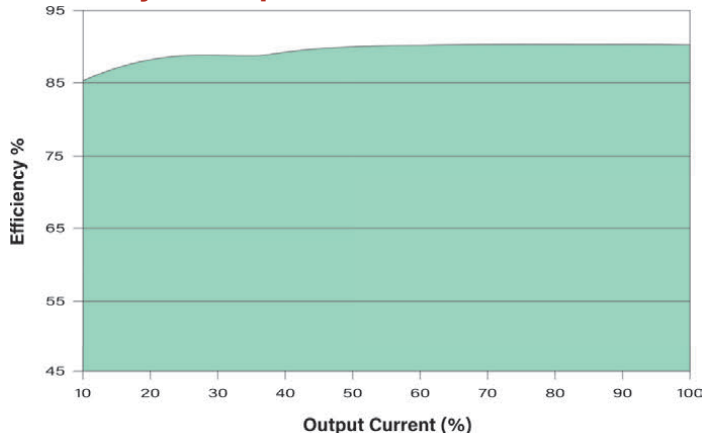
Efficiency vs Output Load: 12 V_{OUT}



Efficiency vs Input Voltage: 24 Vout



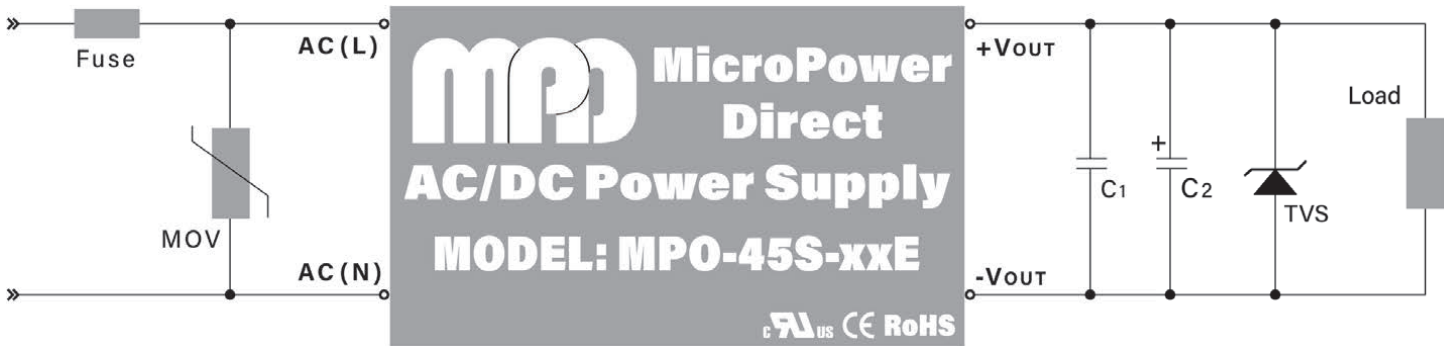
Efficiency vs Output Load: 24 Vout



EMI Characteristics

Parameter	Standard	Criteria	Level
Radiated Emissions	CISPR 32/EN 55032		Class B
Conducted Emissions	CISPR 32/EN 55032		Class B
ESD	EN 61000-4-2	B	±6 kV Contact
RS	EN 61000-4-3	A	10V/m
EFT	EN 61000-4-4	B	±2 kV
Surge	EN 61000-4-5	B	±1 kV L-L
CS	EN 61000-4-6	A	10 Vrms
Voltage Dips	EN 61000-4-11	B	0% - 70%

Typical Connection

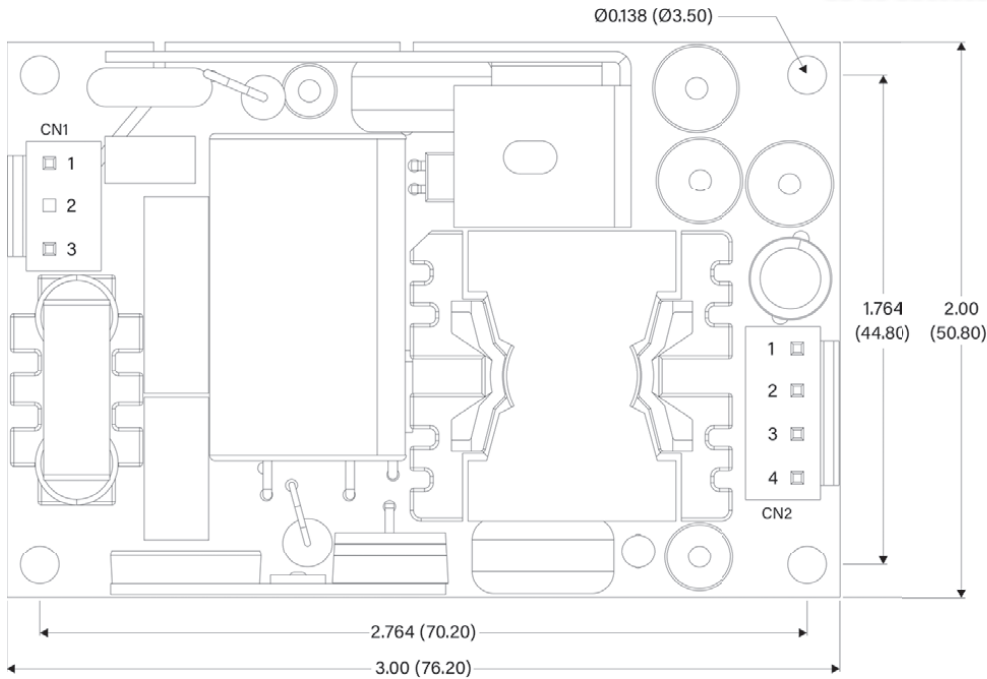


The diagram above illustrates a typical application connection of the MPO-45SE series. Notes on this circuit (starting with the input circuit) are:

1. It is recommended that an external fuse be used. The suggested fuse is a 3.15A/250 VAC slow blow.
2. All units are rated for EN 55032 (CE/RE) class B without external components.
3. The MOV connected across the input protects the unit from possible line surges.
4. If output noise levels lower than the specified limits are required, the addition of C1 and C2 should be sufficient for most applications. The recommended values are shown in the table below. The output filtering capacitor C2 is a high frequency, low ESR electrolytic capacitor. Capacitor C1 is ceramic. Voltage derating of capacitors should be 80% or above.
6. The TVS is added to protect circuits being powered from damage if the module fails.

Model	Fuse	MOV	C1	C2	TVS
MPO-45S-03E	3.15A/250 VAC	S14K300	1.0 μ F/50V	680 μ F/16V	SMBJ7.0A
MPO-45S-05E	3.15A/250 VAC	S14K300	1.0 μ F/50V	680 μ F/16V	SMBJ7.0A
MPO-45S-09E	3.15A/250 VAC	S14K300	1.0 μ F/50V	47 μ F/25V	SMBJ12A
MPO-45S-12E	3.15A/250 VAC	S14K300	1.0 μ F/50V	47 μ F/25V	SMBJ20A
MPO-45S-15E	3.15A/250 VAC	S14K300	1.0 μ F/50V	47 μ F/25V	SMBJ20A
MPO-45S-24E	3.15A/250 VAC	S14K300	1.0 μ F/50V	47 μ F/35V	SMBJ30A
MPO-45S-48E	3.15A/250 VAC	S14K300	1.0 μ F/60V	47 μ F/60V	SMBJ64A

Mechanical Dimensions



Connections

Input Connector (CN1):

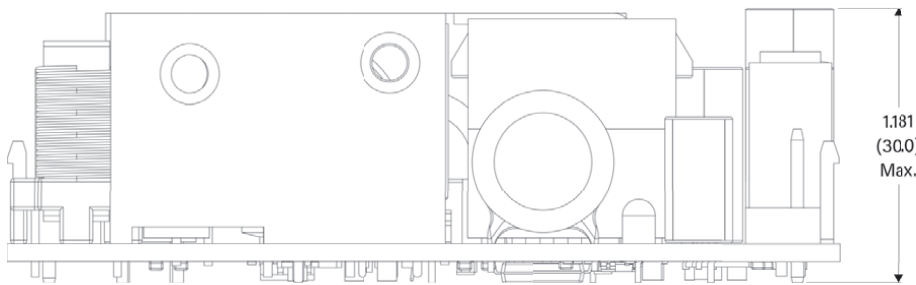
- VH-3A or equivalent (one pin removed)
- Mating Terminal: VH-3Y or equivalent

Pin	Function
1	AC-Line
2	Removed
3	AC-Neutral

Output Connector (CN2):

- VH-4A or equivalent
- Mating Terminal: VH-4Y or equivalent

Pin	Function
1	+V _{OUT}
2	+V _{OUT}
3	-V _{OUT}
4	-V _{OUT}



Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ± 0.02 (± 0.50)
- Max Mounting Hole Torque: 0.4 N-m

MPD offers a very wide range of high performance AC/DC power supplies ranging from 600W UChannel units to 1W units in miniature Single-In-Line (SIP) packages. All are designed and certified to international safety and EMC/EMI standards.

We also offer AC/DC supplies approved for use in medical equipment, DIN rail supplies, "Green" energy supplies and constant power supplies.

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